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ABSTRACT

This paper summarizes a study undertaken to evaluate the impact of middle-level schooling upon student achievement and to provide information useful to the improvement of early adolescent education. The study drew on the following two theoretical perspectives: (1) middle level theory, which advocates organizing students and teachers and modifying curriculum and instruction to meet the needs and abilities of early adolescents; if six programming aspects are adopted, enhanced developmental and achievement outcomes will be realized; and (2) program evaluation theory, which contributed the models of objective-oriented evaluation and management-oriented evaluation used in this study. The study is significant because most research has focused on goals other than academic achievement or has been inconclusive about achievement. Identifying whether actual middle-level programming has been implemented is often unclear. In this study, educators in 10 middle-level and junior high schools were surveyed whether they believed 6 middle-level programming concepts had been implemented in their school. This data was correlated with student achievement in the eighth grade. Results indicated that middle-level programming had been implemented with varying degrees in the 10 schools. It was also found that five of the six middle-level program concepts, as well as averaged overall concepts, were related positively with enhanced student achievement. Recommendations for improving middle-level education based on the study include: movement toward full implementation of middle level programming should continue; the practices of whole group ability grouping and tracking should not be used in schools for early adolescents; developmentally appropriate teaching strategies should be maximized; student accountability should focus more on project accomplishment and skill mastery; strategies which enhance teacher efficacy should be implemented; identifying sites with high implementation of middle level programming concepts for the purpose of having practitioners visit those sites should be encouraged; and further research is needed. (TM)

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A Summary of "An Evaluation of Middle Level Schooling: Implementation of Programming Concepts in Relation to Student Achievement"

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Statement of the Problem/Purpose of the Study

The November 1988 issue of **ASCD Curriculum Update** was devoted to the subject of middle schools. In that issue Gordon Cawelti stated,

> Substantial research on the middle school has already been carried out. Most of the research comparing it with junior high has not yet produced consistent evidence of superior achievement, but the middle school does permit the pursuit of other goals deemed important to these early adolescents.

The study reported here was undertaken in an effort to address the fact that to date, research on middle level schooling has been inconclusive as regards student achievement. Middle level schooling constitutes a major reorganization, may be very costly, and requires significant change on the part of educators. Consequently, practitioners and decision makers have much need of information about its efficacy. **An Evaluation of Middle Level Schooling: Implementation of Programming Concepts In Relation to Student Achievement** was a direct attempt to evaluate the impact of middle level schooling upon student achievement and to provide information useful to improvement of practice for the education of early adolescents.

Rationale for the Study

This study drew from two different theoretical perspectives, those of middle level theory and program evaluation theory.

Middle schooling is a way of organizing students and teachers and modifying curriculum and instructional strategies to address the unique personal development and achievement needs of early adolescents. Middle level schooling often includes a different grade configuration (e.g., 6th through 8th grades rather than the traditional 7th through 9th grades), but more importantly it includes program concepts that are intended to create a school more in line with needs and abilities of early adolescents than would be provided through the junior high model. These program concepts have been defined by Alexander and George (1981) as:

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1) interdisciplinary teaming/block scheduling,

2) guidance services (often referred to as Advisor/Advisee),

3) exploratory curriculum,

4) developmentally appropriate teaching strategies,

5) transition/ articulation services, and

6) appropriate required curriculum/learning skills.

According to middle level theory, if these six programming concepts are implemented, the outcomes of enhanced personal development, group citizenship, and academic learning/achievement will be attained. This study focused on all six of the middle level program concepts as they relate to the academic learning outcome only.

Program evaluation is intended to "provide educators with information they need to help improve educational practices." It is a formal process to facilitate "determination of the quality, effectiveness, or value of a program" (Worthen and Sanders, 1987). Evaluation theory includes six major approaches which constitute groupings of more specific evaluation models. Two of the six approaches were used in this study: (1) objectives-oriented evaluation, and (2) management-oriented evaluation.

This study, therefore, is the application of a management-oriented evaluation and objectives-oriented evaluation to the academic learning/achievement outcome of middle level theory.

Significance of the Study

Middle level schooling as a movement within American education has been unique. It spans almost a century. It has the enduring quality of focusing on better serving students' needs. It has captured the attention of many teachers, and to a great extent has been "grass roots" in nature. Yet throughout this movement, the research efforts have tended to concentrate on inductive studies, sub-components of the middle level philosophy, or the personal development and group citizenship goals, rather than the achievement goals. In particular, attempts to ascertain the relationship between middle level programming and student achievement have been inconclusive. Part of the problem with this line of inquiry has been that, although some schools are named middle level schools rather than junior high schools, they do not differ programmatically from the more traditional junior high schools, which tend to operate much like mini-high schools. Consequently, identifying

the extent to which implementation of middle level programming has actually taken place must be an important part of any research or evaluation attempt.

Commenting upon middle level research, Mergendoller (1993) indicated: "too much emphasis has been placed on the theoretical rationale for reform (e.g., 'to meet the unique developmental needs of early adolescents') and not enough time has been spent on exploring the processes and results of the reforms being proposed. Without detailed knowledge of what types of programs, under what conditions, actually provide a better match to the unique, developmental needs of early adolescents, practitioners are left to select or design programs with little knowledge of their effectiveness."

Research Design

This study was conducted in ten middle level/junior high schools within an urban, midwestern school district. This school district was in the process, over a several year time period, of transitioning from a more traditional junior high model to the middle level model. Educators in those ten schools were surveyed to obtain information concerning the extent to which they believed the six middle level programming concepts had been implemented within their school. This information constituted the independent variable in the design for this study. The dependent variable was student achievement in the 8th grade as indicated by scores on the California Achievement Tests (CAT). The study asked the question: Is there a relationship between implementation of middle level program concepts and achievement of departing 8th grade students while controlling for gender, socio-economic status (SES), race, and 6th grade achievement? Figure 1 presents a visual model of the design of the study.

FIGURE 1

A VISUAL MODEL OF THE EVALUATION OF MIDDLE LEVEL SCHOOLING

Dependent Variable		Covariate Variable		Independent Variable		Mediating Variables		Error
	=		+		+		+	
Student 8th Grade Achievement (CAT scores)		Student 6th Grade Achievement (CAT scores)		Implementation of Middle Level Programming by School		- SES - Gender - Race		Chance and Other Variables

The data used for this study included the results from the survey of educators to assess the level of implementation, and student achievement scores. The survey was created specifically for use in studying the middle level movement in this district. It was based on a review of literature, a subsequent review by district administrators, and field testing by the district-wide middle level task force. The survey was completed by 381 middle school/junior high school professional staff, which constituted 73 percent of the total population. The achievement scores used were the reading, language arts, mathematics, and composite battery scores from the California Achievement Tests for those students for whom both 6th and 8th grade scores could be accessed. This resulted in a sample of 2,323 which was 74 percent of the total 8th grade population for that district, that year.

The first step of the data analysis began with calculation of descriptive data about implementation of middle level programming in the ten schools. Second, mean achievement scores were calculated for the 6th and 8th grade levels for the total population and according to mediating variables. The third step of the analysis was multiple regression with analysis of covariance modeling and correlation. The multiple regression was conducted to determine if the independent variable (implementation of middle level programming) and the mediating variables (6th grade achievement (the covariate), race, gender, and socio-economic status) were significant factors in predicting the dependent variable (8th grade achievement). The regression included all variables in the equation simultaneously. The correlation was conducted to identify the relationship of the variables one at a time with 8th grade achievement and to clarify the direction of the relationship. The regressions and correlations for each of the four scores were conducted for the total population of students as well as for seven sub-populations (e.g., all males, low income students, Hispanic females).

Findings

The results showed that the six middle level programming concepts have been implemented to varying degrees across the ten schools. The data also indicate that, without reference to the variables

included in the design of this study, student achievement declined in this district's middle grades for this cohort of students. The decline in mathematics was the greatest.

The multiple regressions and correlation analyses indicate that five of the six middle level program concepts, and the overall concept (an averaging of the six concepts) are related significantly with enhanced student achievement as measured by one or more of the standardized tests used in this study. The specific programming concept which was included most frequently in the prediction equation as influencing the variance in achievement (three achievement scores out of four possible) was Appropriate Required Curriculum/Learning Skills. In addition, both Developmentally Appropriate Teaching Strategies and Interdisciplinary Teaming had a positive relationship with higher achievement for two scores. However, the guidance program concept, Advisor/Advisee, had a negative relationship with student achievement for the language arts score and the composite battery score. (Note: Advisor/Advisee is a "homeroom" type approach which often includes instruction regarding personal and social interaction issues.)

The mathematics score was influenced positively by each of the middle level programming concepts except Advisor/Advisee. Females and low income students in particular were more likely to achieve a positive, significant relationship between greater implementation of middle level programming and subsequent mathematics achievement.

The covariate in this study, 6th grade achievement, was the largest single predictor of 8th grade achievement. Gender, race, and socio-economic status were also correlated with achievement in varying ways.

Conclusions and Recommendations

Middle level theory proposes that middle level programming will enhance student achievement, personal development, and group citizenship. This study examined the achievement portion of the theory within an evaluation framework. The conclusion offered is that certain of the middle level programming concepts, when implemented, do relate positively with student

achievement. However, Advisor/Advisee related negatively to student achievement in the areas of language arts and on the composite battery score. This outcome clearly needs further examination. Theorists might also consider refining middle level theory such that it specifies which middle level programming component addresses each of the three intended goals.

In regard to evaluation theory, a useful regression analysis model was formulated and applied. It used program implementation level as the independent variable and desired outcome as the dependent variable. This model is certainly applicable to other programs and to goals other than student achievement. In that sense it contributes to the repertoire of evaluation analysis tools available for use within the context of various program evaluations. This approach could be especially useful to assess relationships among program variables at a school or district level and thus facilitate better decisions and ultimately improved practice.

Recommendations which follow are based on the results from this study in combination with findings from existent literature (Eccles et al., 1993; MacIver and Epstein, 1993; Anderman and Maehr, 1994):

- Movement toward full implementation of middle level programming should continue although Advisor/Advisee needs further examination. Ideally Advisor/Advisee should contribute to positive achievement of early adolescents.
- The practices of whole group ability grouping and tracking should not be used in schools for early adolescents. They are in opposition to the Appropriate Required Curriculum/Learning Skills program concept. Exposure to curriculum, the opportunity to learn, is necessary for growth in achievement.
- The use of developmentally appropriate teaching strategies which emphasize involvement and choice-making on the part of students should be maximized.
- Student accountability should focus more on project accomplishment and skill mastery, and less on test scores and grades.

- Strategies which enhance teacher efficacy should be implemented. Interdisciplinary teaming may be a useful approach.
- Identifying school sites with high implementation of the various middle level programming concepts for the purpose of having practitioners visit those sites to learn about ideal practices should be encouraged.
- Further research as to the relationship between middle level programming and student achievement is needed. For example, what is it about middle level programming and mathematics achievement that is so unique? And can that be replicated for other subject areas?

Middle level programming, when implemented with full consideration for the students' experience, shows promise of contributing in a significant, positive way to addressing the needs and enhancing the academic growth of early adolescents.

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